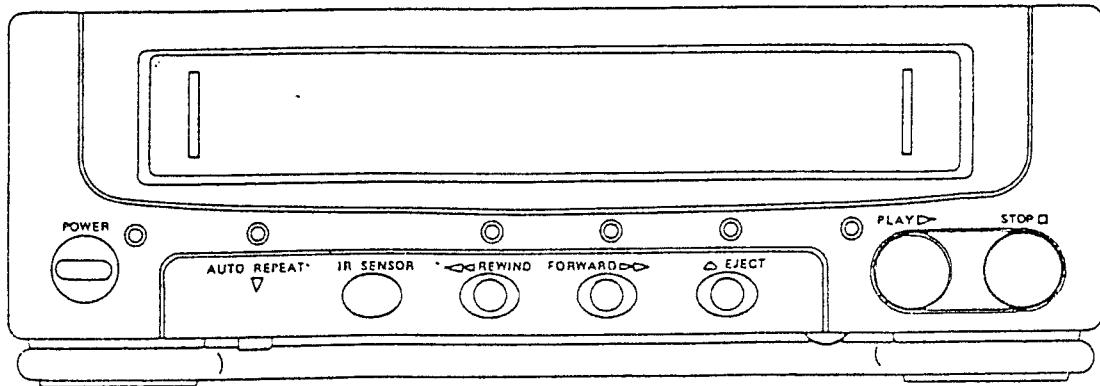


# Service Manual

VCP 9975



LENCO

CIRCUIT ADJUSTMENT METHOD  
\*\*\*\*\*

1990.10.30.

MODEL:

=====

\*Before adjustment, all semi-volume must be center position.

\*Oscilloscope Probe : (10:1)

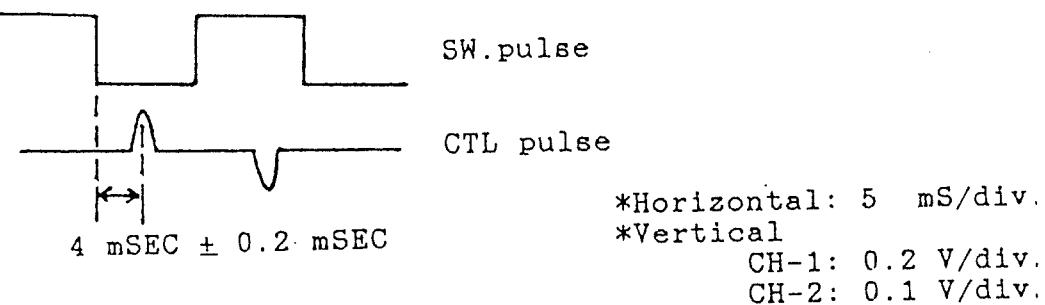
\*All adjustment should be done in regular sequence.

1. SERVO CIRCUIT ADJUSTMENT METHOD

(1) SUB-TRACKING

Adj.Location	Test Point	Equipment	Mode	Test Tape
RVS1	TP09 (SW.P) TP12 (CTL)	Oscilloscope	Play	N - 2 (Stairsteps)

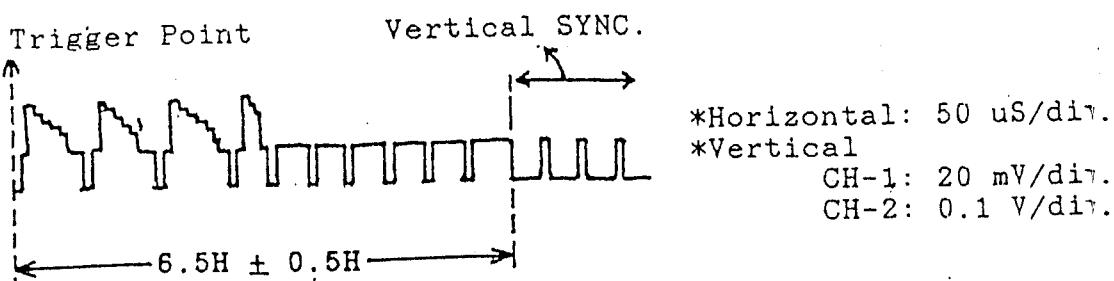
- 1) Set the tracking volume to the mechanical center where it clicks , play the test tape.
- 2) Set the oscilloscope in the chop mode and connect the CH-1 to the SW.P, the CH-2 to the CTL pulse with CH-1 trigger.
- 3) Adjust RVS1 until the phase difference between the falling edge of the SW.pulse and the CTL positive pulse is  $4 \text{ mSEC} \pm 0.2 \text{ mSEC}$ . as shown below.



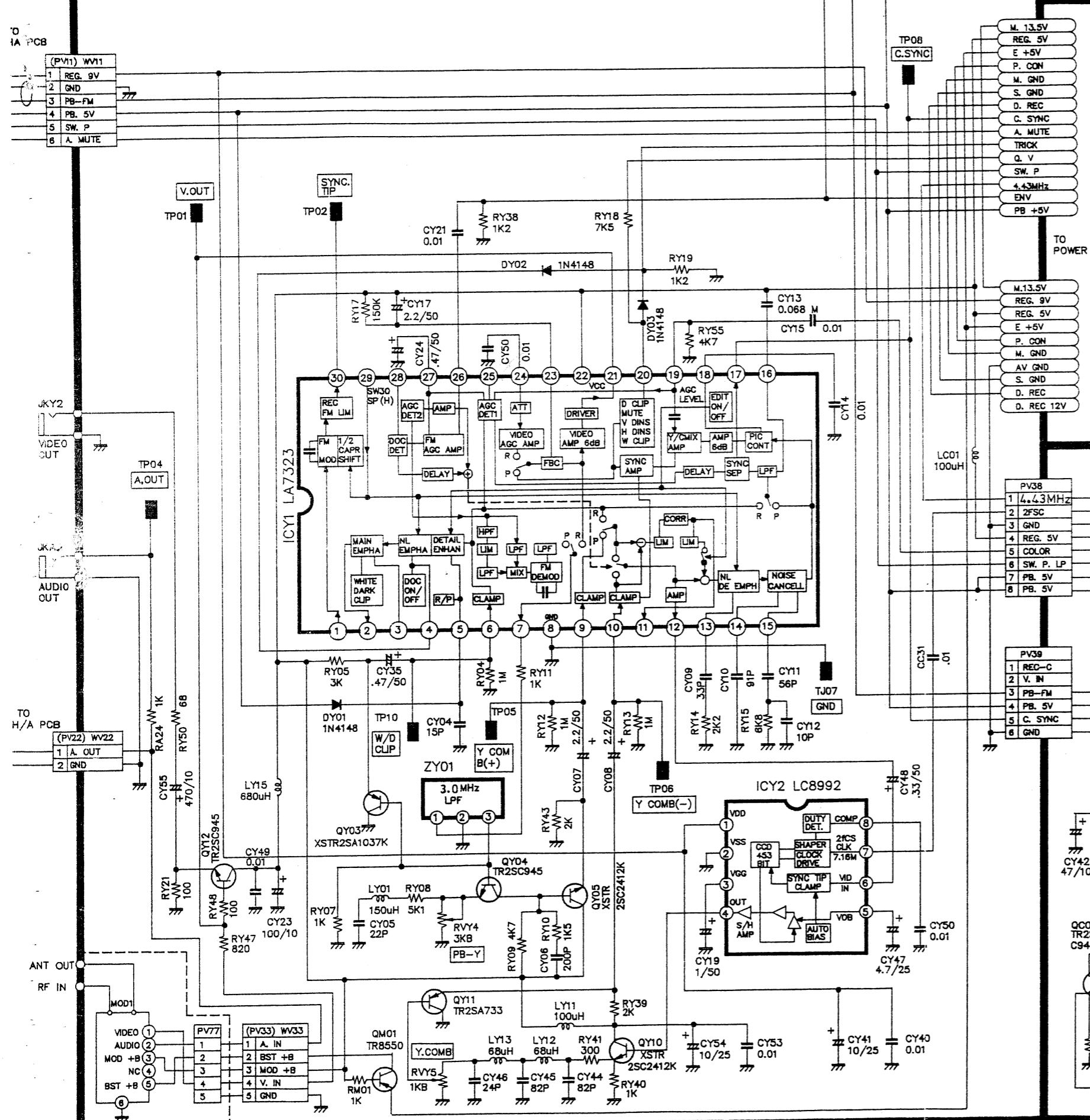
(2) VIDEO HEAD SWITCHING

Adj.Location	Test Point	Equipment	Mode	Test Tape
RVS2	TP01 (V.OUT) TP09 (SW.P)	Oscilloscope	Play	N - 1 (Color Bars)

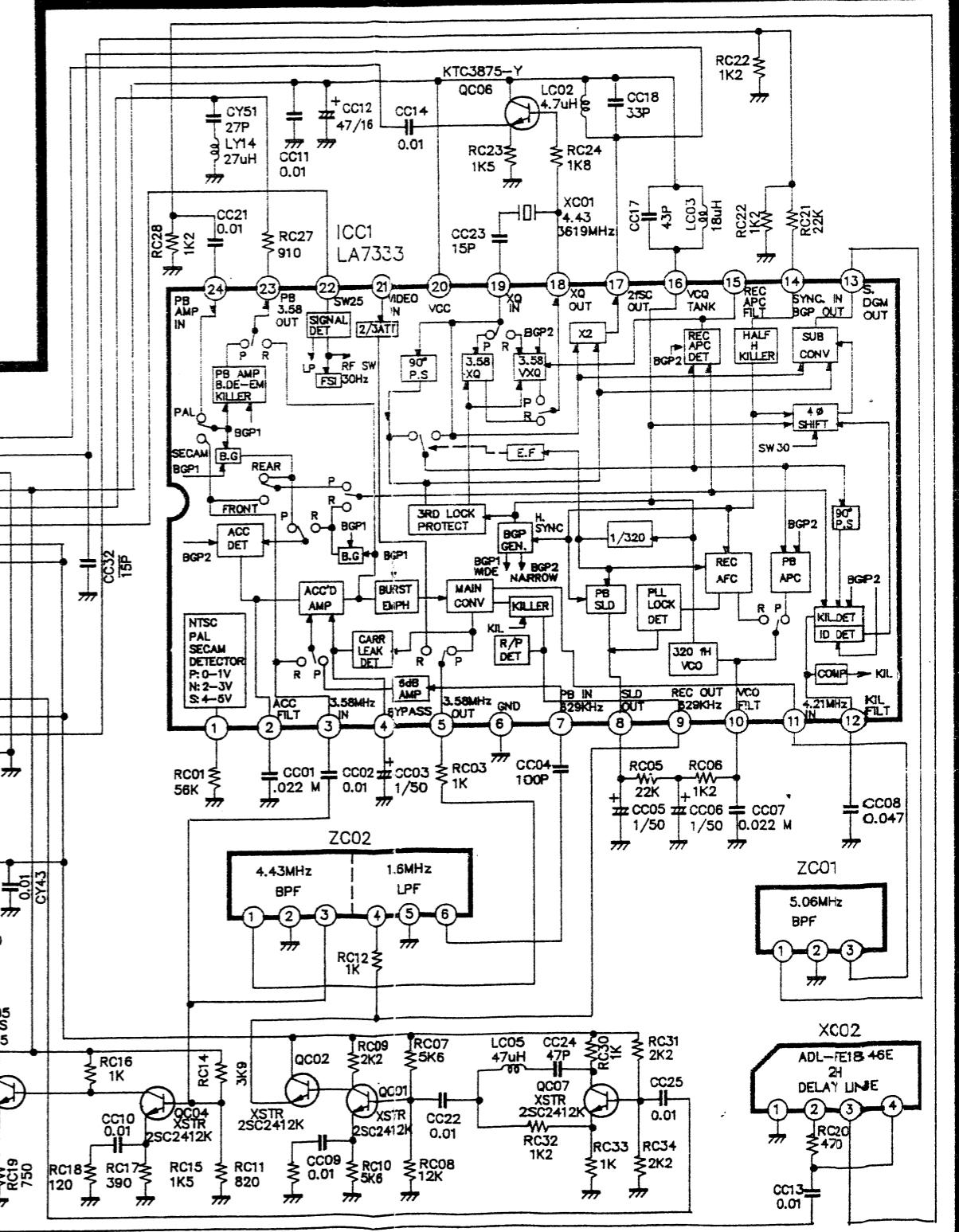
- 1) Set the tracking volume to the mechanical center where it clicks , play the test tape.
- 2) Set the oscilloscope to connect the CH-1 to TP01 (V.OUT), the CH-2 to TP09 (SW.pulse) with CH-2 trigger.
- 3) Adjust RVS2 for the positive trigger until  $6.5H \pm 0.5H$  cycles before the vertical SYNC.pulse as shown below.

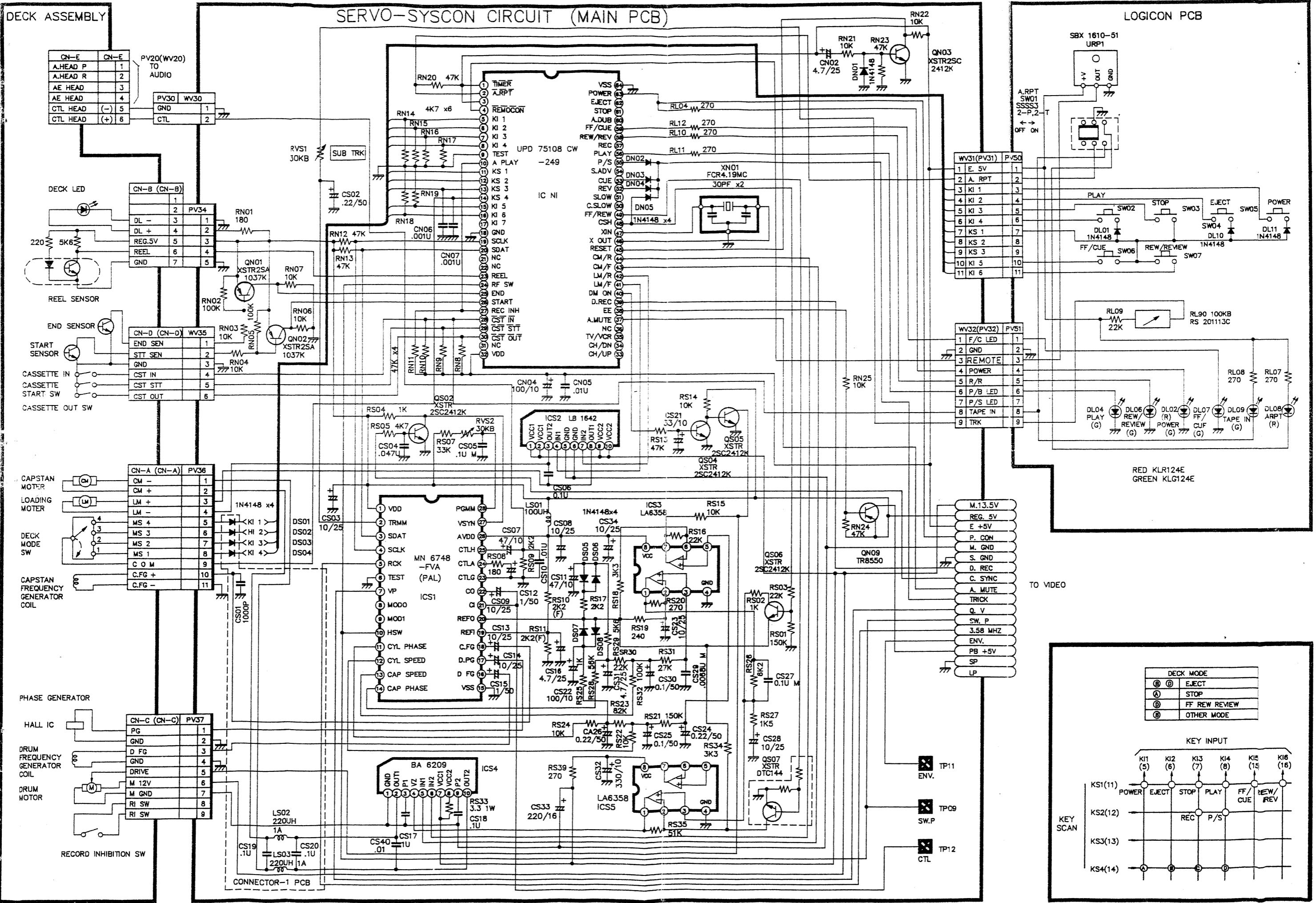


## VIDEO CIRCUIT (MAIN PCB)

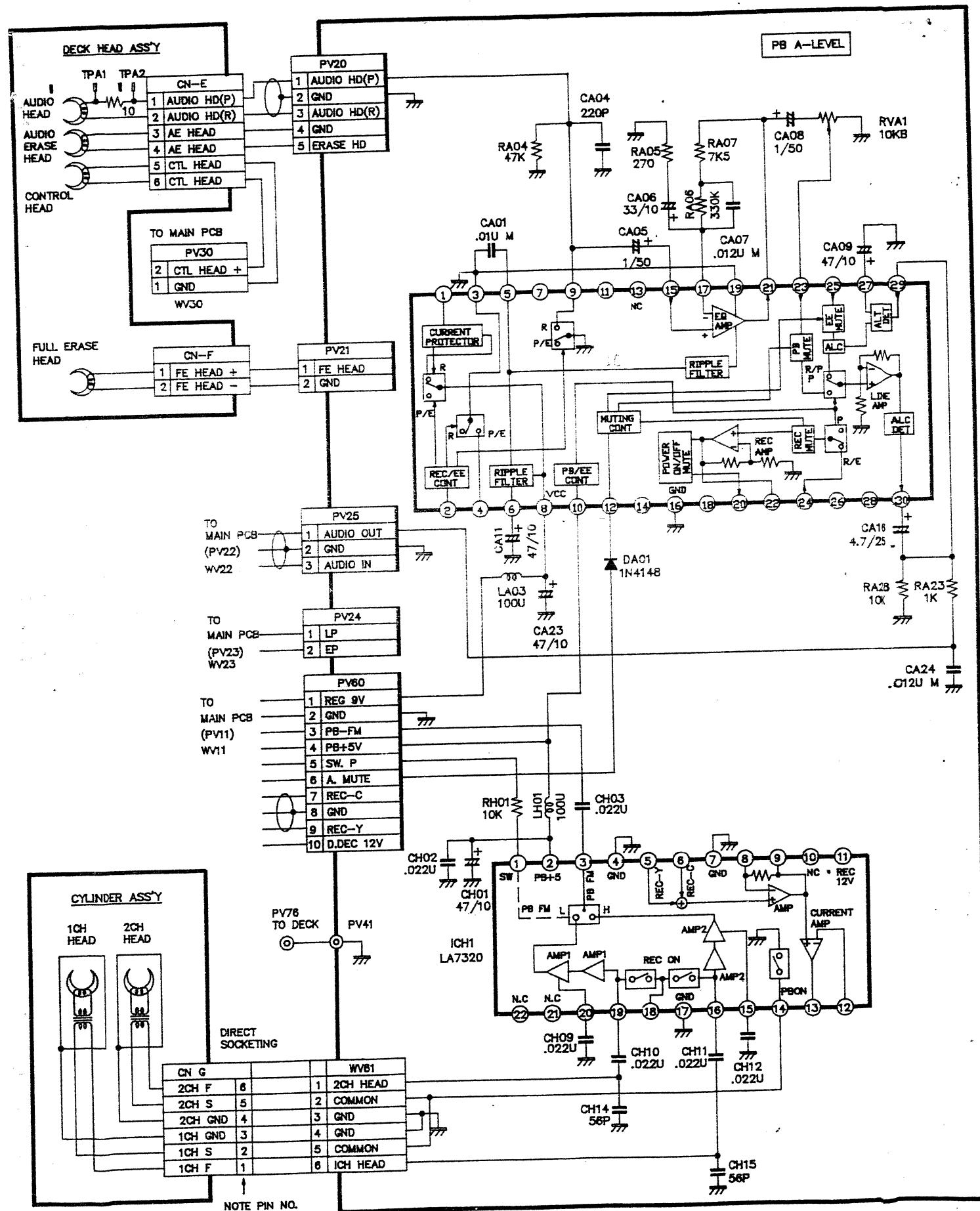


### CHROMA CIRCUIT (CHROMA PCB)





# HEAD / AUDIO AMP CIRCUIT (HA PCB)

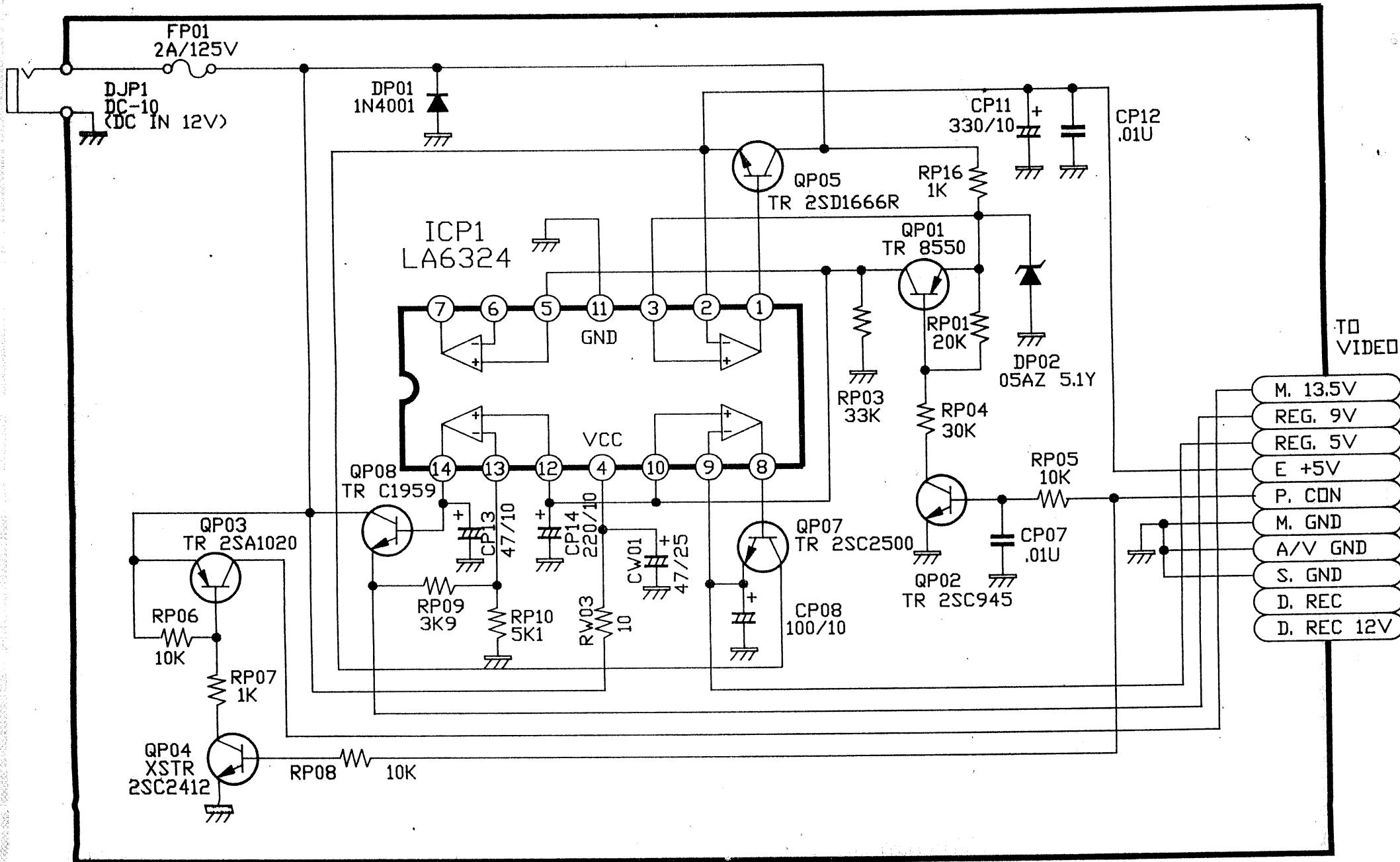


NOTE PIN NO.

NTSC/PAL  
SECAM

POWER CIRCUIT (MAIN PCB)

MODEL NO: VCP-050 NTSC/PAL/SECAM



CIRCUIT ADJUSTMENT METHOD  
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MODEL:

1990.10.30.

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\*Before adjustment, all semi-volume must be center position.  
\*Oscilloscope Probe : (10:1)

2. VIDEO CIRCUIT ADJUSTMENT METHOD

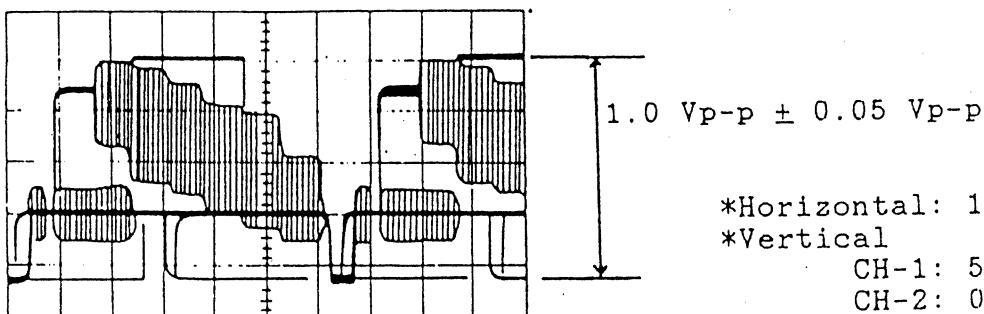
(1) PLAY BACK Y-SIGNAL OUTPUT LEVEL

\*Before adjustment, 75 ohm resistor should be terminated between Video out jack and GND.

Adj. Location	Test Point	Equipment	Mode	Test Tape
RVY4 (3K B)	VIDEO OUT JACK	Oscilloscope	Play	N - 1 (Color Bars)

TP08 (C.SYNC.)

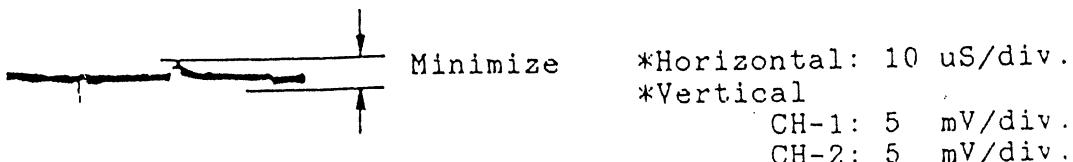
- 1) Play back the test tape.
- 2) Connect the oscilloscope to video out jack(CH-1, AC IN) and trigger the scope with a composite SYNC.signal at TP08(CH-2, AC IN). Adjust the scope so that it can display a waveform of approx. 2H.
- 3) Adjust RVY4 to obtain  $1.0 \text{ Vp-p} \pm 0.05 \text{ Vp-p}$  between the SYNC.TIP and 100 % white level.



(2) Y-COMB ( NOISE CANCELLER )

Adj. Location	Test Point	Equipment	Mode	Test Tape
RVY5	TP05 (Y-COMB +) TP06 (Y-COMB -)	Oscilloscope	Play	N - 1 (Color Bars)

- 1) Play back the test tape.
- 2) Connect the oscilloscope to TP05(CH-1, AC IN) and TP06(CH-2, AC IN). Set the oscilloscope to be "CHOP" mode and vertical range of CH-1, CH-2 to be equal.
- 3) Set the oscilloscope the "ADD" mode after inverting the CH-2.
- 4) Adjust RVY5 to minimize the output level.



CIRCUIT ADJUSTMENT METHOD  
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MODEL:

1990.10.30.

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\*Before adjustment, all semi-volume must be center position.

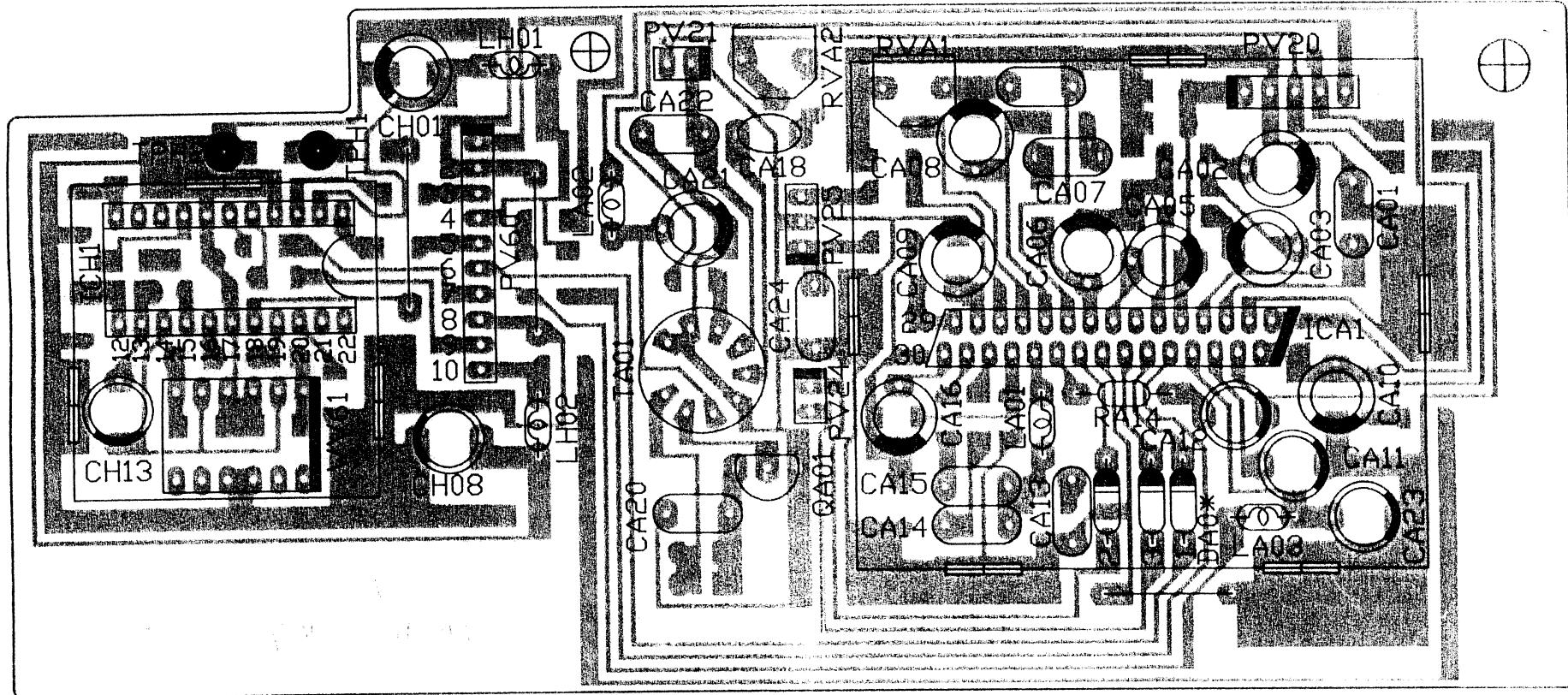
3. AUDIO CIRCUIT ADJUSTMENT METHOD

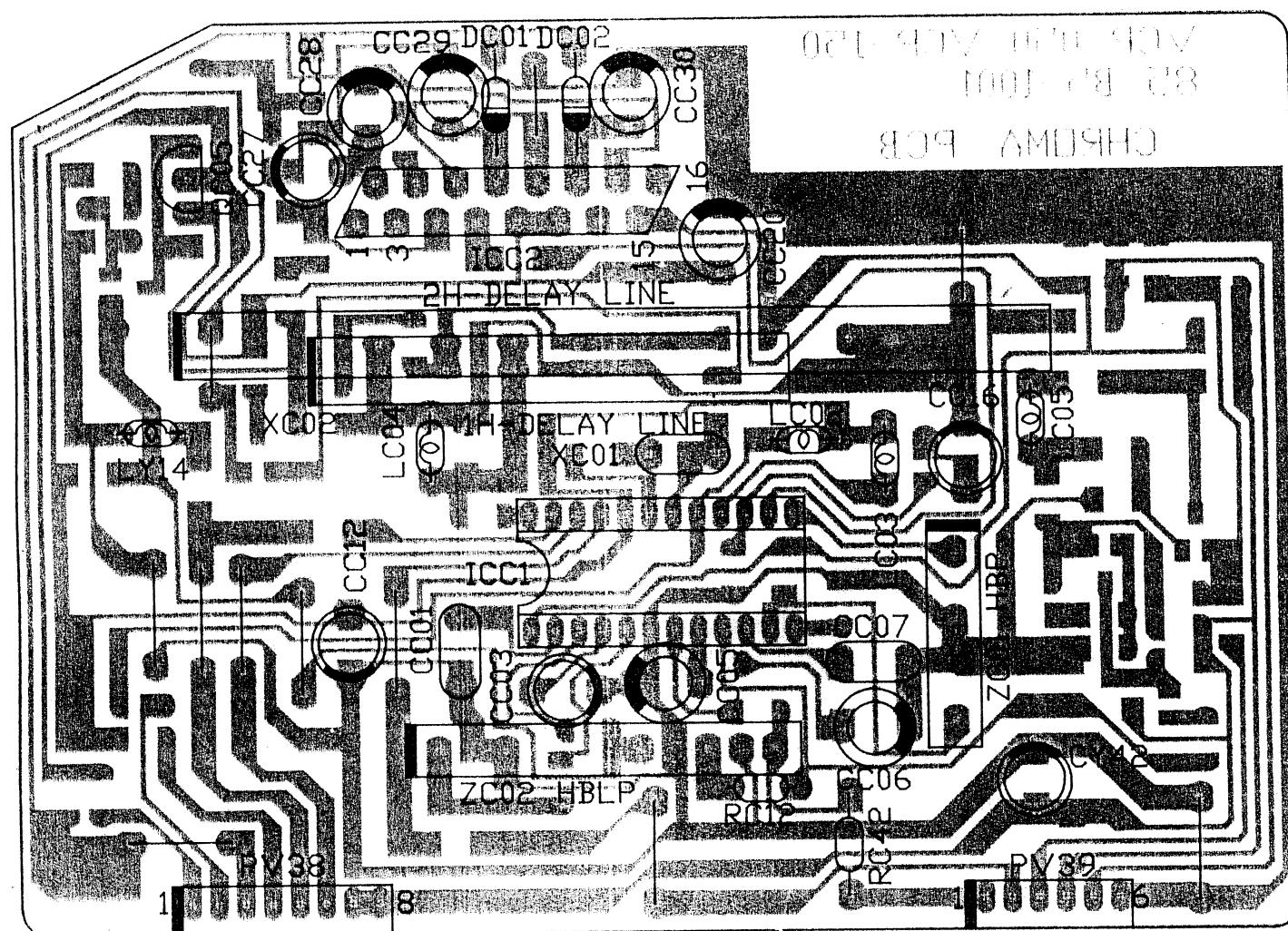
(1) PLAY BACK OUTPUT LEVEL

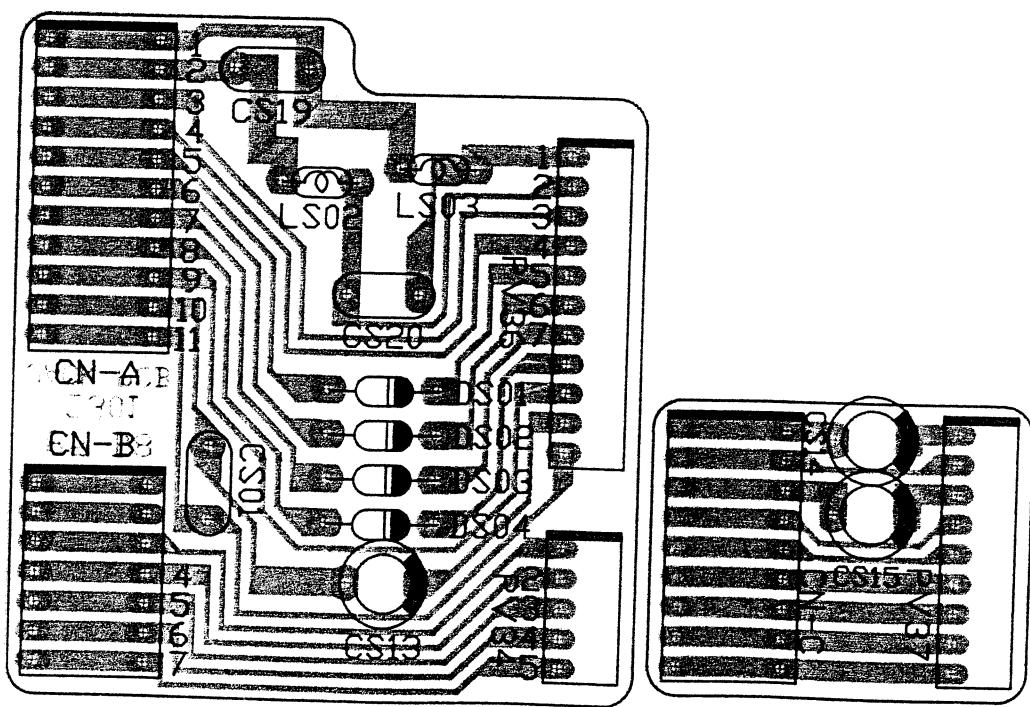
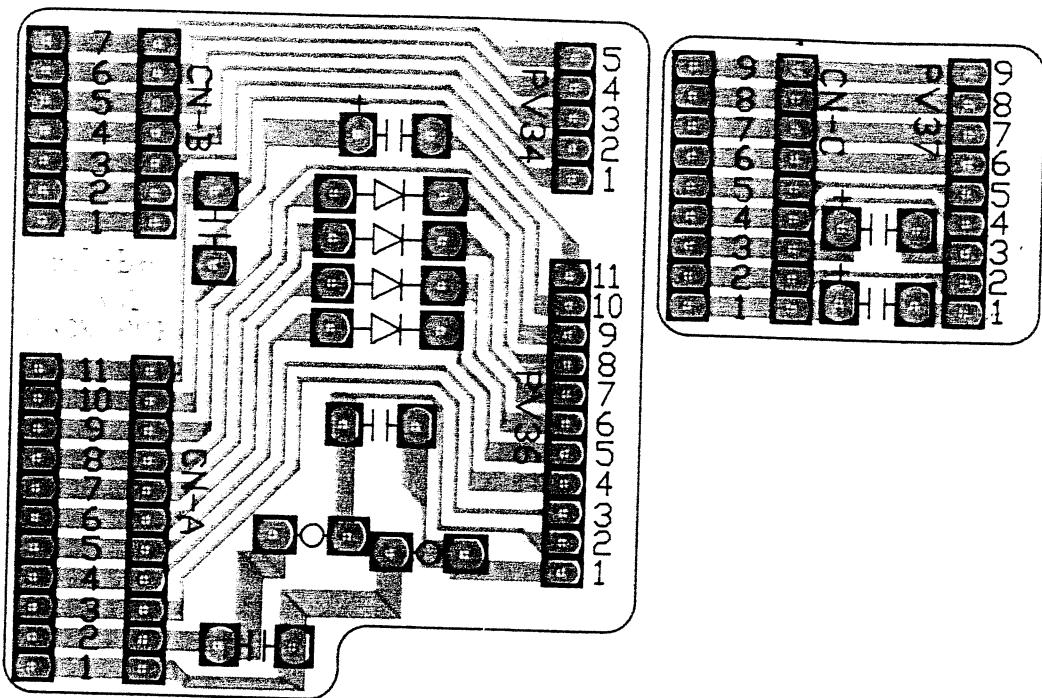
Adj.Location	Test Point	Equipment	Mode	Test Tape
RVA1 (10K B)	TP04 (A.OUT)	A.L.M.	Play	N - 1 (Color bar) 1 KHz 0 dBm

- 1) Connect the audio level meter to TP04, and play back the test tape.
- 2) Adjust RVA1 until A.L.M.(Audio Level Meter) reads -5 dBm ± 0.2 dBm.

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# ELECTRICAL ADJUSTMENT

## PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

### Required Test Equipment

1. Oscilloscope: Wide-band, Dual-trace W/EXT TRIG 40 MHz
2. Colour Monitor Television
3. Test tape: TNS-1
4. Audio Noise Meter or Distortion Metre

### Alignment Tape Contents

Ref. No.	Video Signal	Audio Signal	Applications
TNS-1	Stairstep	8 kHz (-30 dB)	<ul style="list-style-type: none"><li>• Tracking Volume Preset</li><li>• Audio Azimuth</li><li>• PG</li><li>• X-Value</li></ul>

## TEST POINT

TEST POINT	DESCRIPTION
TP-07/	VIDEO OUT
TP-12	CTL
TP-09	RFS
TP-	GND
TP-11	PB ENV

# 1. SWITCHING POSITION ADJUSTMENT (PG-1, PG-2)

Specified Tape

TNS-1 (A: 8 kHz V: Stairsteps)

Specified Measuring

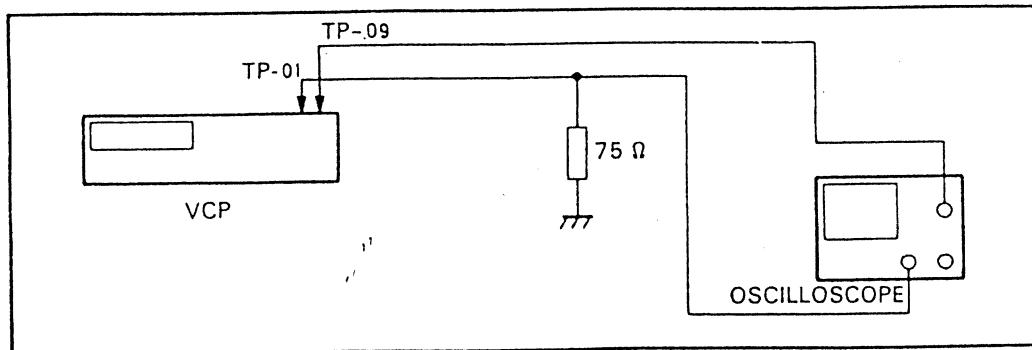
Oscilloscope (Dual-Trace W/EXT TRIG 40 MHz)

Equipment

Connections

Oscilloscope Ch. 1 probe to TP-01

Oscilloscope EXT TRIG probe core to TP-09

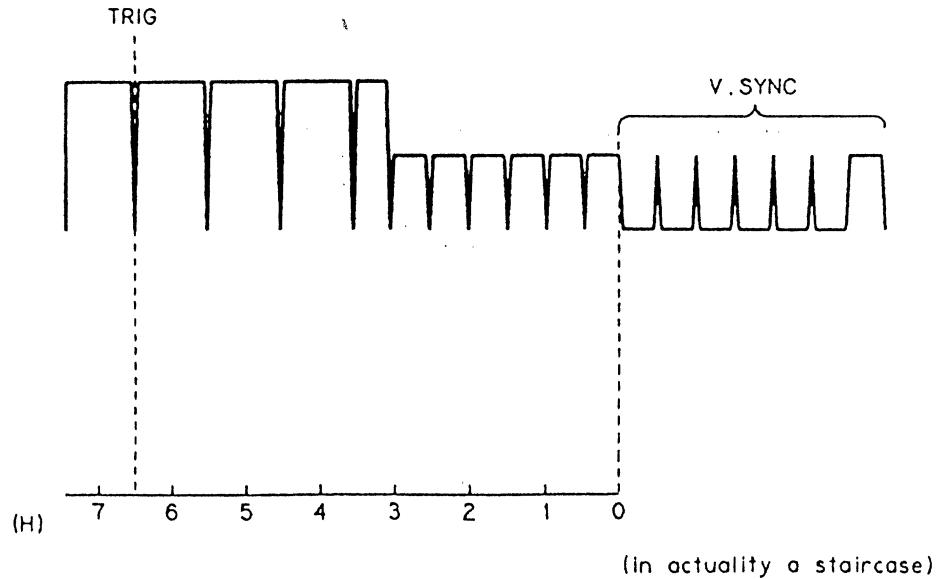


Adjustments

At PCB → ADJ. \*V.R. set to that the no. of horizontal scan lines from the FR switching position to the V SYNC leading edge is 6.5H.... PG

\*V.R. = VARIABLE RESISTOR

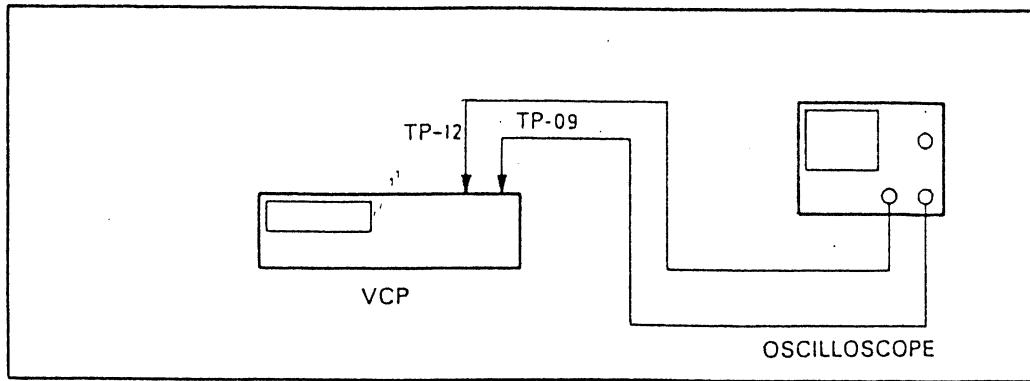
## VHS SPECIFICATION $6.5 \pm 1.5$ H



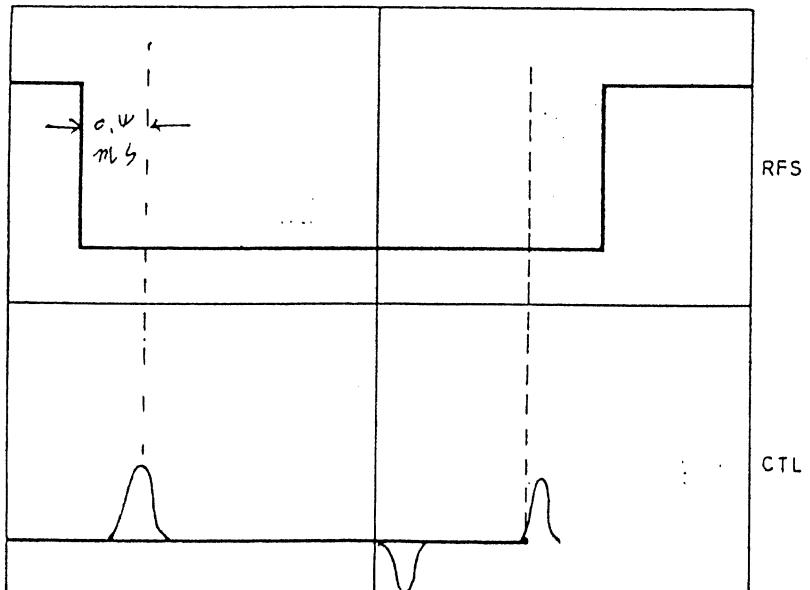
Whether waveform (1) or (2) is present, adjust to 6.5H.

## 2. TRACKING PRESET ADJUSTMENT

Specified Tape TNS-1 (A: 8 kHz V: Stairstep)  
Specified Measuring Equipment Oscilloscope (Dual-Trace W/EXT TRIG 40 MHz)  
Connections Oscilloscope Ch. 1 to TP-12  
Oscilloscope Ch. 2 to TP-09



Adjustments At PCB TRACKING PRESET ADJ. V.R, set CTL output waveform so that it is in the + 1.7 ms position against RFS.



### Oscilloscope Setting

TIME/DIV: 2 ms    SCOPE: -    COUPLING: AC    SOURCE: EXT    VOLT/DIV: 0.2 (Probe  $\times 10$ )

### 3. AUDIO AZIMUTH ADJUSTMENT

Specified Tape

TNS-1 (A: 8 kHz V: Stairstep)

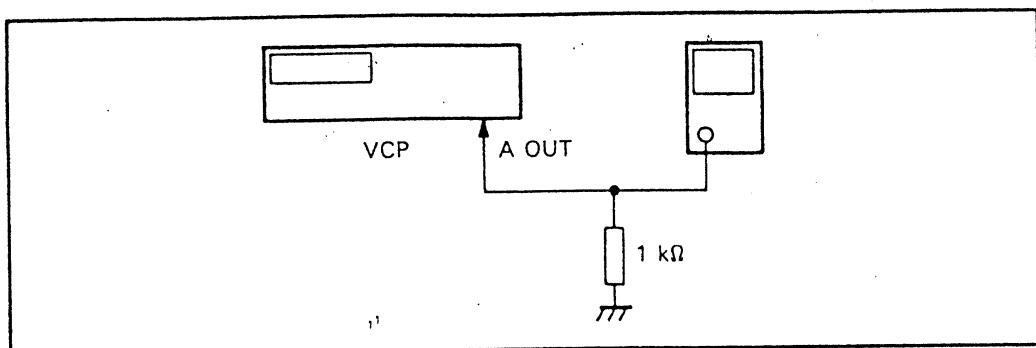
Specified Measuring

AUDIO NOISE METRE (MN-445A, or equivalent)

Equipment

AUDIO OUT: AUDIO NOISE METRE (w/1 kΩ load)

Connections



Adjustments

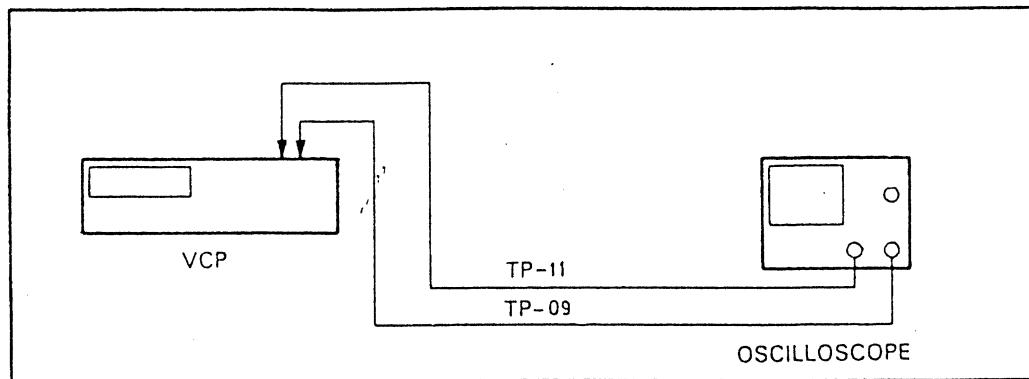
Adjust the AUDIO HEAD AZIMUTH screw so the AUDIO OUT 8 k output level is maximum with the TNS-1 in the playback mode (refer to diagram of deck adjustment locations for AUDIO HEAD AZIMUTH screw position).

Precautionary Items

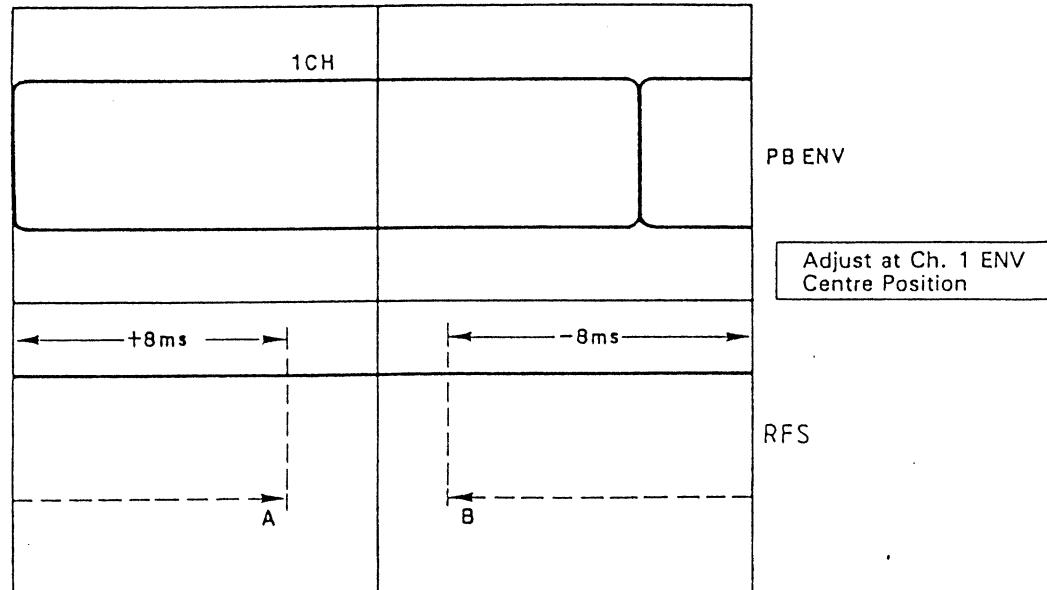
Affix thread lock after adjusting. If, after completion of x-value adjustment, the AUDIO HEAD AZIMUTH is readjusted, readjust x-value as well.

## 4. X-VALUE ADJUSTMENT

Specified Tape TNS-1 (A: 8 kHz V: Stairstep)  
Specified Measuring Oscilloscope (Dual-Trace W/EXT TRIG 40 MHz)  
Equipment  
Connections Oscilloscope Ch. 1 to TP-11  
Oscilloscope Ch. 2 to TP-09



### Adjustments

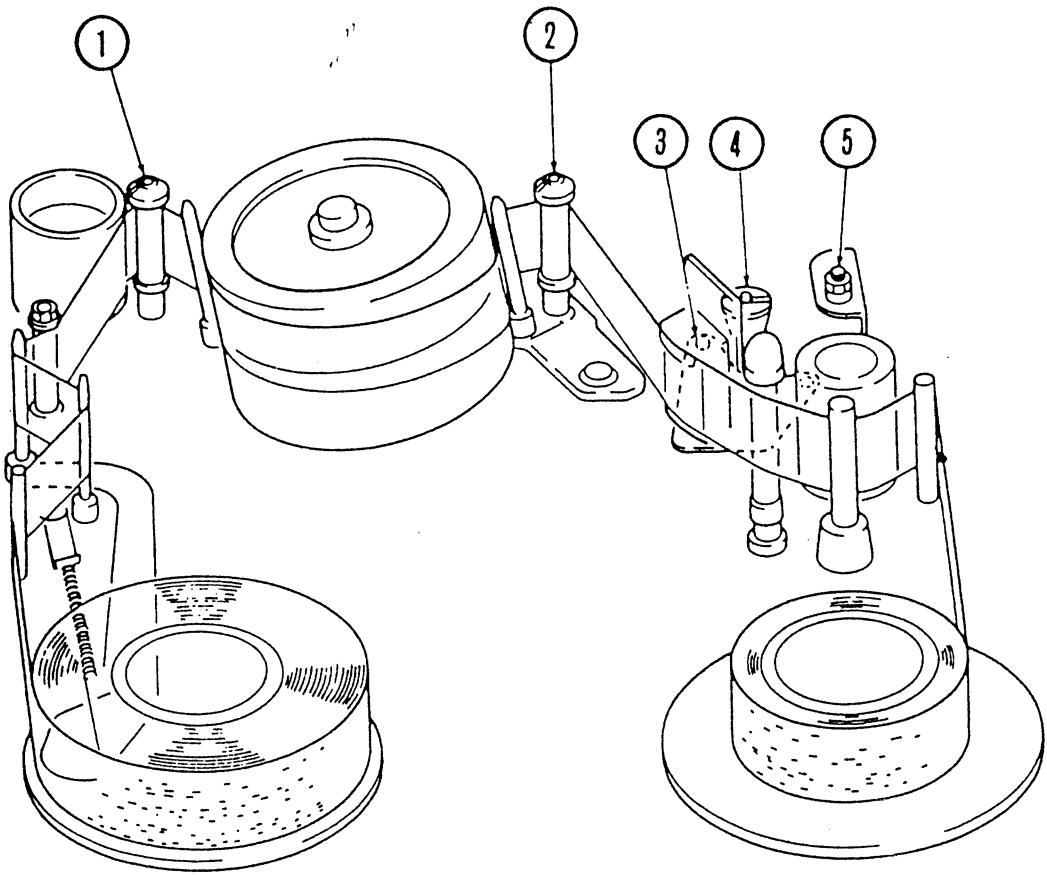


# MECHANICAL ADJUSTMENT

## TEST POINTS AND ALIGNMENT (VCR DECK)

### VCR DECK adjustment points

- ① ENVELOPE entrance adjustment screw
- ② ENVELOPE exit adjustment screw
- ③ AUDIO AZIMUTH adjustment screw
- ④ AUDIO/CTL HEAD ajustment screw
- ⑤ X-Value adjustment screw



## ADJUSTMENT PROCEDURES

### 1. ADJUSTMENT OF THE BT TORQUE OF THE DECK MECHANISM (Fig. 1)

Bend the portion marked \*, by suing a pair of pincers or the like, toward the direction indicated by an arrow to adjust the BT torque.

Bent toward direction Ⓐ : BT torque goes up.

Bent toward direction Ⓑ : BT torque goes down.

Caution : Do not damage the main chassis with the pincers.

Do not over-bend the portion marked \*.

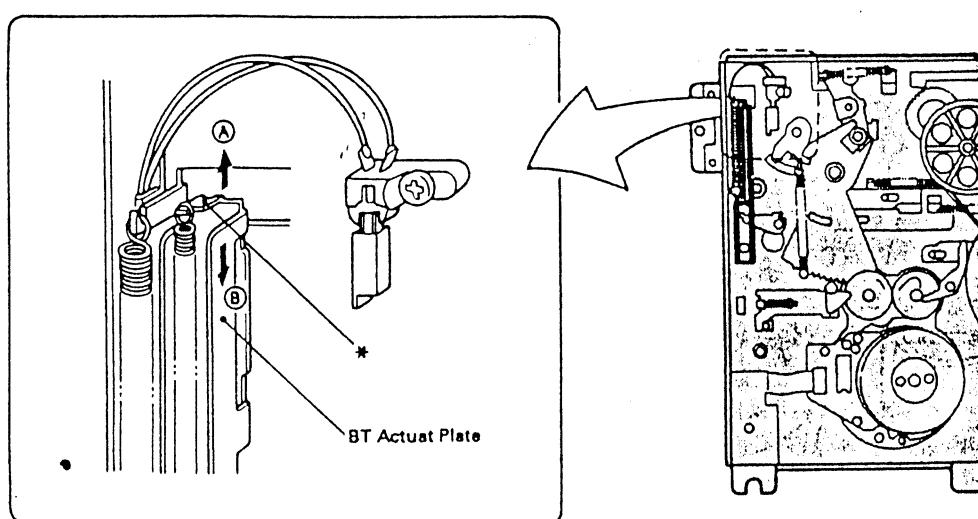


Fig. 1

### 2. IN THE PLAY MODE (Without a Tape) (Fig. 2)

While securing the BT Band Ass'y by inserting an eyeletter or something similar through the hole, adjust the distance between the rim of the BT Arm Semi Ass'y end and the chassis lug so that the rim of the BT Arm Semi Ass'y end is in the centre of Ⓜ (Half punch) as shown in the illustration.

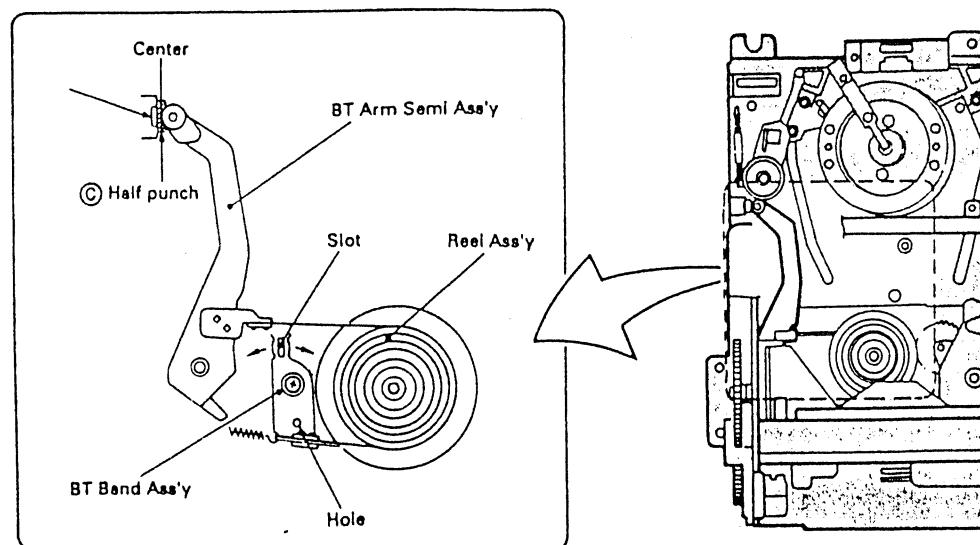


Fig. 2

### 3. REEL DISK HEIGHT

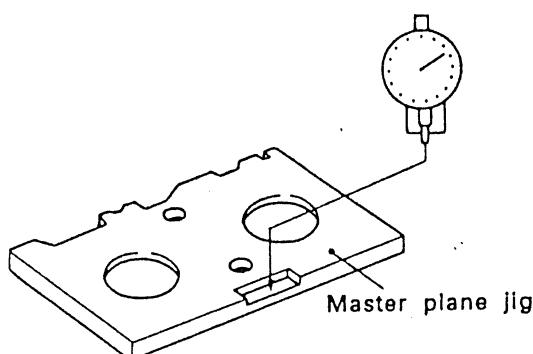


Fig.3 Master plane jig setting

- a) Set the master plane jig as shown in Fig.3.

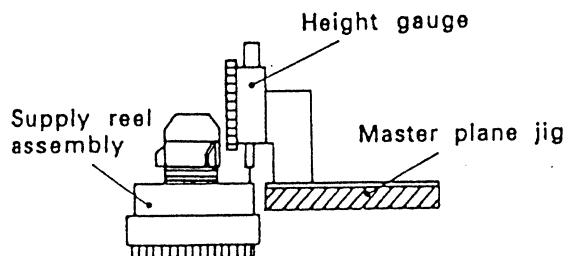


Fig.4 Reel height adjustment

- b) Set dial gauge on the master plane.
- c) Check reel assembly height measure at two places 90° apart ( $\pm 0.2$  mm) Fig.4.

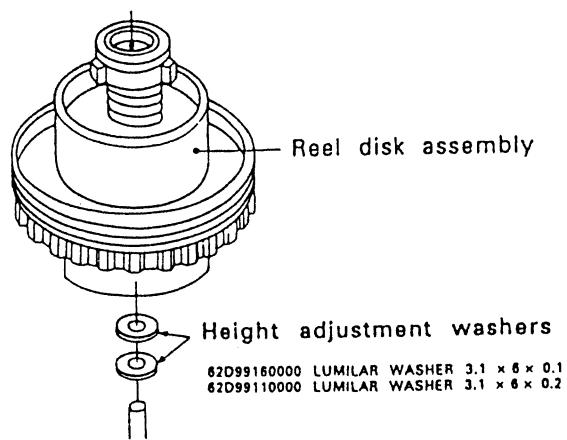


Fig.5 Washers for height adjustment

- d) If it is necessary to adjust the height, add or subtract the required number of height adjustment washers as shown in Fig.5.

- e) After reassembling, confirm a small amount of mechanical play between reel disk and slit washer.

### 4. GUIDE POLE HEIGHT ADJUSTMENT

- a) Set the master plane jig as shown in Fig.3.

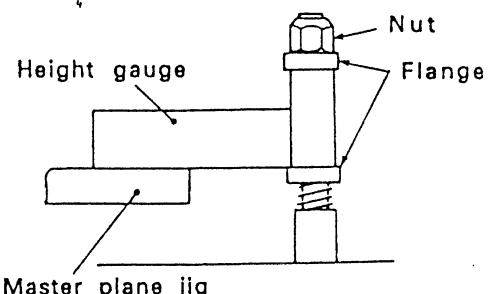


Fig.6 Guide pole height adjustment

- b) Set the height gauge on the master plane jig as shown in Fig.6.
- c) For each guide pole, check the height of the upper face of the lower flange. If necessary, carefully adjust by turning the nut.
- d) If guide pole height has been adjusted, the checks and adjustments described in the following pages are required.

## 5. AUDIO/CTL HEAD

### 5-A: Tape transport adjustment

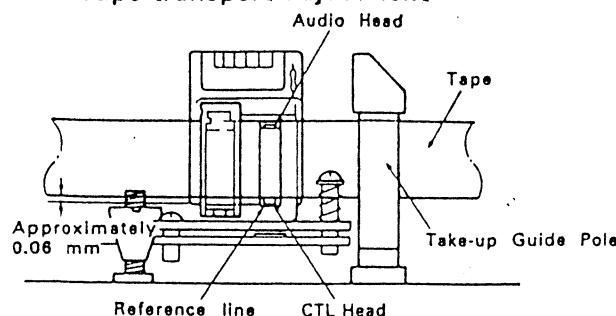


Fig.7 Audio/CTL Head adjustment

- Employ self-recording tape and set for PLAY mode.
- Turn screw © (Fig.7-A) and adjust for smooth transport at the take-up guide pole.
- 5-B: Audio/CTL Head height and azimuth**
  - Connect oscilloscope to Audio Out.
  - Play alignment tape (8 kHz and stairstep signals) and measure the audio output level.
  - Turn nut ®, and screws ® and © in succession by small and equal increments at a time and adjust for maximum audio output level. With reference to nut ®, adjust azimuth with screws ® and © so that small tape wrinkles are not produced at the guide pole, but at the same time, audio output is at maximum and level fluctuations, minimum. It is suggested that you first turn nut ® by a small amount, then turn screws ® and © by an equal amount and set for maximum output.
  - Carefully and evenly adjust nut ®, and screws ® and © to align the Audio/CTL Head height with the tape as shown in Fig.7.

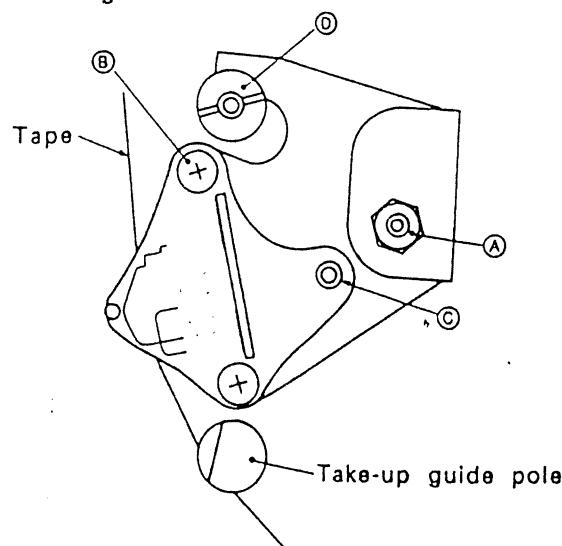


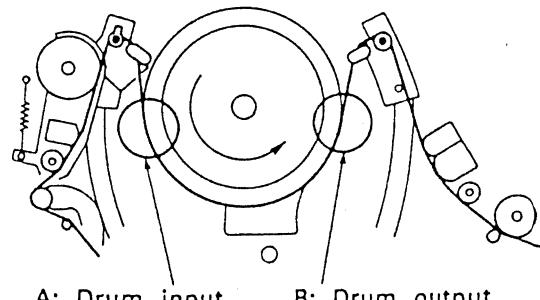
Fig. 7-A

## 6. TAPE TRANSPORT SYSTEM CHECKS AND ADJUSTMENT

The tape transport system has been precisely aligned at the factory and normally does not require readjustment. The following steps are therefore necessary only in cases of severe usage or when replacing parts affecting the tape transport system.

### 6-A: Tape transport check

- Employ self-recording tape and operate the machine between PLAY and STOP modes several times.
- During PLAY mode, observe tape at the input and output portions (A and B in Fig.8) of the head drum lead. Confirm that the tape slips neither upward nor downward with respect to the lead as shown in Fig.9.



A: Drum input      B: Drum output

Fig.8 Tape transport check

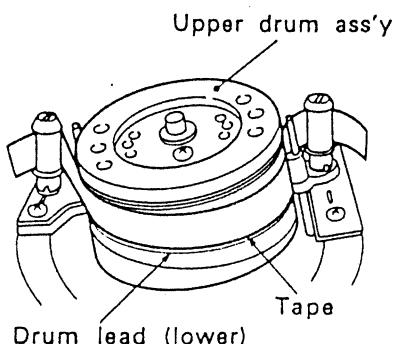
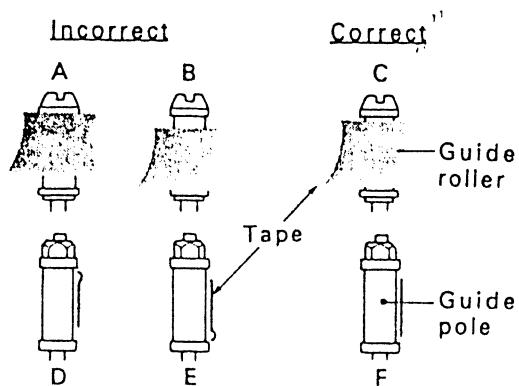


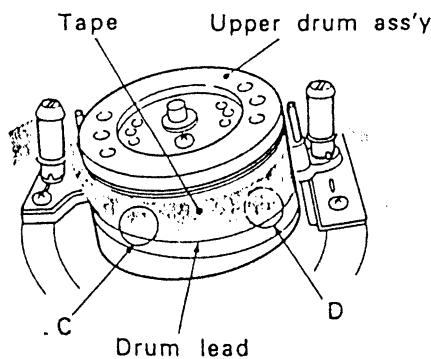
Fig.9 Drum lead check - 1

**NOTES:**

- Slips upward : sound is produced by contact between tips of rotating heads and edge of tape.
- Slips downward : tape curls or wrinkles from contacting lead face (sound may also be produced).
- During loading, play and unloading, observe the tape at the supply guide rollers and poles, and takeup guide rollers. Confirm absence of curling, wrinkling, etc., as shown in Fig.10.

**Fig.10 Guide roller and guide pole**

- Observe the tape as it wraps around the drum during loading and as it separates from the drum during unloading. Confirm absence of damage to the tape at points C and D as shown in Fig.11 and absence of contact noise between head tips and tape edge.

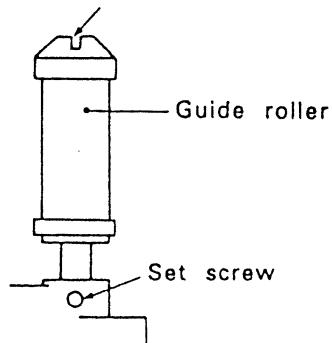
**Fig.11 Drum lead check - 2**

- If defects are noted during the above checks, perform the following adjustments.

**6-B: Guide roller height adjustment**

- Slightly loosen set screws of the supply and take-up guide rollers as shown in Fig.12.
- Employ self-recording tape and set for PLAY mode.
- With a slotted screwdriver, slightly turn the supply guide roller (do not turn more than 180° at a time) and adjust so that at the drum input, the tape travels smoothly in the drum lead without slipping upwards or downwards.
- Similarly, adjust the take-up guide roller for the drum output.

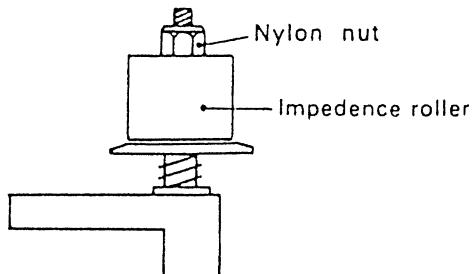
Turn with slotted screwdriver

**Fig.12 Guide roller height adjustment****NOTES:**

- Loosen the set screws only enough to allow the guide rollers to be turned. If excessively loose, tape motion may turn the rollers inadvertently.
- Turn the rollers carefully to avoid damage to the tape.

**6-C: Adjustment of the impedance roller**

While tape is running in the reverse direction : Adjust the height of the nylon nut so that the tape guide flange does not interfere with the bottom edge of the tape.

**Fig.13 Supply guide pole height adjustment**

#### **6-D: Tape transport check at the take-up guide pole**

Generally no adjustment will be necessary for the take-up guide pole. However, adjustments or checks will be needed when replacing the Audio/CTL Head or parts affecting the tape transport system after a long periods of operation.

- a) Employ a self-recording tape and set for PLAY mode.
  - b) Turn Audio/CTL Head screw ② as shown in Fig.14 and adjust for smooth transport at the take-up guide pole as shown by F of Fig.10.

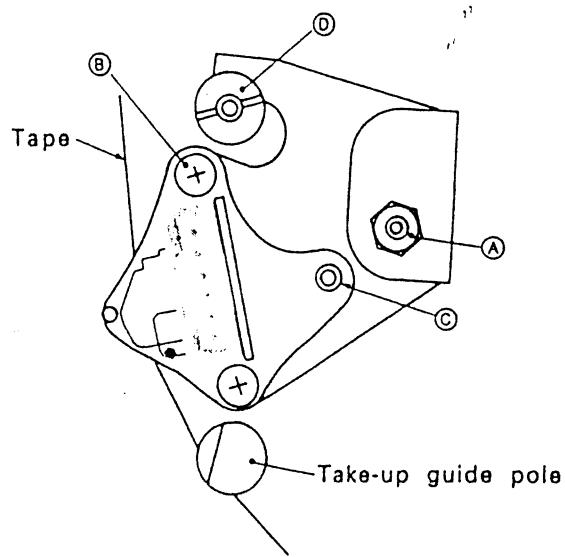


Fig.14 Take-up guide pole

## **7. INTERCHANGEABILITY ADJUSTMENT**

Before using alignment tape, employ self-recording tape and confirm correct tape transport.

## 7-A PRELIMINARY CHECKS

### 1. Check sequence 1

- a) Connect oscilloscope to TP-E  
At this time, trigger the oscilloscope externally with a signal (RF SWITCHING PULSE) from TP-C.
  - b) Play stairstep portion of the alignment tape.
  - c) Turn the Tracking control and adjust for maximum FM output at DECK TERMINAL TP-E.  
Set the Tracking control to centre click position and confirm that nearly maximum output is obtained.

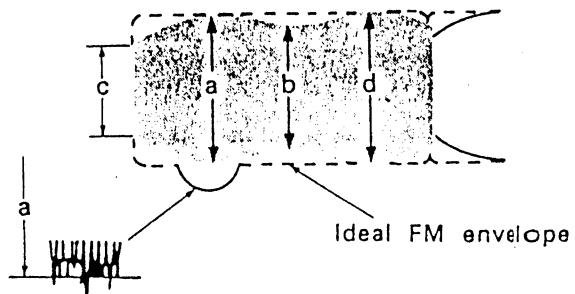


Fig.15 FM waveform (max. output)

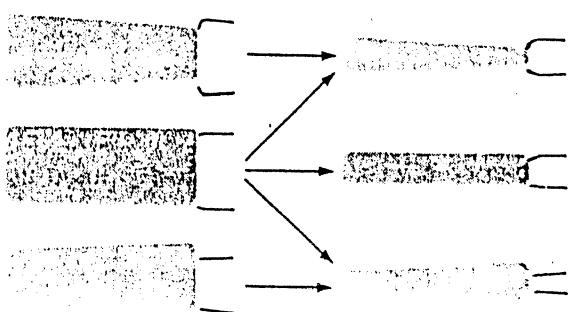


Fig.16 Normal waveform examples

- d) Refer to Fig.15. Read the level of portion (a) of the waveform. If the waveform is serrated at point (a), read the value at the most uniform serrations as shown above in Fig.16.

e) As shown by the broken lines, read the FM waveform value at point (b) and confirm that:

$$\frac{b}{a} \geq 0.65 \text{ or } 20 \log \frac{b}{a} \geq -3dB$$

f) Read the values at points (c) and (d) [drum input and output] and confirm that

$$\frac{b}{a} \geq 0.65 \text{ or } 20 \log \frac{b}{a} \geq -3d$$

- f) Read the values at points (c) and (d) [drum input and output] and confirm that

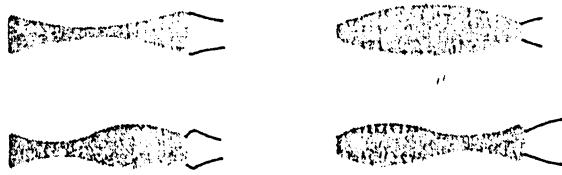
$$\frac{c}{a} \geq 0.5 \text{ and } \frac{d}{a} \geq 0.5 (\geq -6)$$

**NOTES:**

- Read minimum levels for (b), (c), and (d).
- If above checks yield normal results, proceed to section I-B.
- If defects are noted, perform preliminary adjustments in section II.

**2. Check sequence 2**

- Observe the FM waveform as in the previous section (I-A) and turn the Tracking control. The waveform variation should be nearly parallel as shown in Fig.16.
- If the waveform varies as shown in Fig.17, adjustment is required.

**Fig.17 Incorrect waveform examples****7-B PRELIMINARY ADJUSTMENTS**

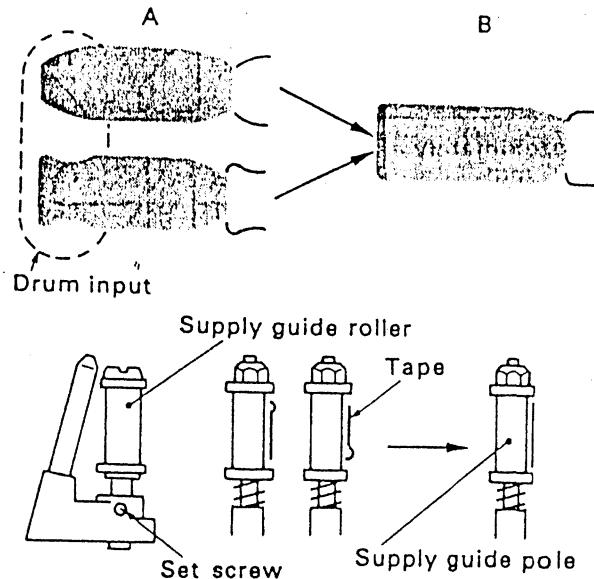
- Loosen the set screws of the supply guide roller and take-up guide roller. If the guide rollers turn freely, slightly tighten the set screws.
- Connect oscilloscope to TP-E. Trigger the oscilloscope externally with a signal from TP-C.
- Play the alignment tape (stairstep signal).

**1. Drum input**

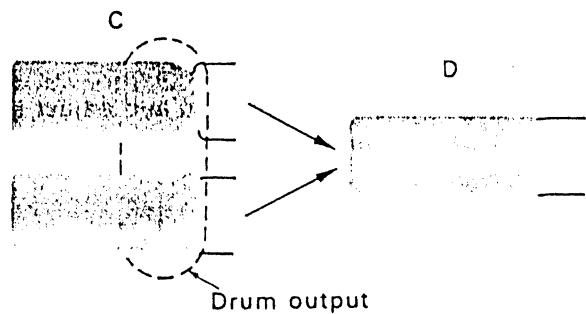
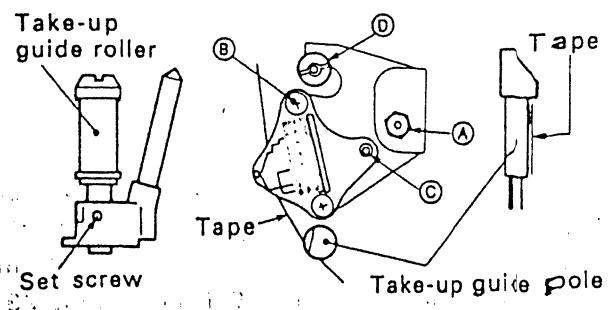
- Observe oscilloscope display and adjust the Tracking control for maximum FM output.
- Refer to Fig.18. Examples of incorrect waveform are shown by A. Use a slotted screwdriver to adjust the supply guide roller so that the rising portion (drum input portion) on the waveform becomes flat as shown by B.

**NOTES:**

- If the guide roller turns freely, tighten the set screw slightly.
- Be sure to adjust the guide roller only by small increments at a time in order to avoid damaging the alignment tape. In addition to observing the waveform, confirm absence of tape slippage or curling at the drum lead and guide poles.
- At the supply guide pole, if the tape separates from the guide or wrinkling occurs, adjust the guide pole height.

**Fig.18 Drum input adjustment****2. Drum output**

- In the same manner as for the drum input, turn the take-up guide roller to adjust the falling portion (drum output portion) of the FM waveform. Incorrect examples are shown by C in Fig.19, while D indicates the correct adjustment.
- If the tape separates from the guide or wrinkling occurs at the take-up guide pole, adjust by turning screw ② of the Audio/CTL Head as shown in Fig.20.

**Fig.19 Drum output adjustment****Fig.20 Take-up guide pole**

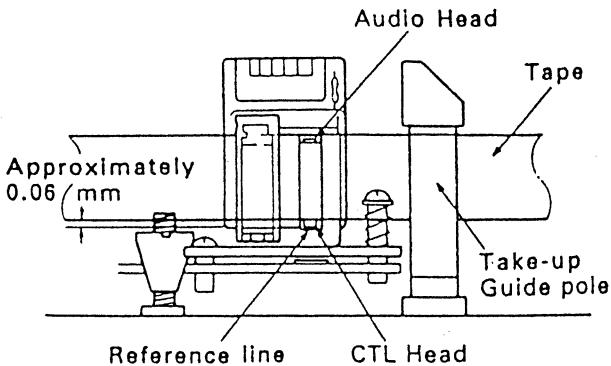


Fig.21 Audio/CTL Head height

- c) Carefully and evenly adjust screws ⑧ and ⑨, and nut ⑩ to align the Audio/CTL Head height with the tape as shown in Fig.21.

**NOTES:**

- Fine adjustment is not required at this time. It is sufficient that the tape is engaged with the guide pole and that the servo operates properly (control signal picked up).
- If the tape separates from the take-up guide pole or wrinkling occurs, screw ⑨ (Fig.20) has been turned excessively with respect to nut ⑩ and screw ⑧ causing the Audio/CTL Head to incline forward or backward. Use care to adjust screws ⑧ and ⑨, and nut ⑩ evenly and observe that small wrinkles are not produced at the take-up guide pole.

#### 7-C: INTERCHANGEABILITY FINE ADJUSTMENT

- a) Connect oscilloscope to TP-E. Observe the FM waveform and adjust the Tracking control for minimum FM output level.

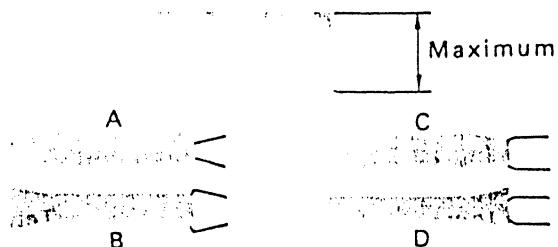


Fig.22 Minimum FM output (incorrect examples)

- b) If there are waveforms as shown by A or B in Fig.22, carefully adjust the supply guide roller height so that the waveform appears as shown by E, F, or G in Fig.23. At this time, if the waveform fluctuates, adjust to the point of minimum fluctuation.

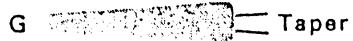
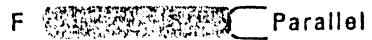
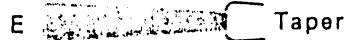


Fig.23 Minimum FM output (correct examples)

- c) If the FM waveform appears as shown by C or D in Fig.22, carefully adjust the take-up guide roller height to obtain a waveform such as shown by E, F, or G in Fig.23.

At this time, if the waveform fluctuates, adjust to the point of minimum fluctuation.

- d) Vary the Tracking control from maximum to minimum FM output. Perform fine adjustment of supply and take-up guide rollers so that waveform variation appears as shown by E, F, or G of Fig.23.

#### 7-D: AUDIO/CTL HEAD HEIGHT, AZIMUTH AND INCLINATION

See section 5-B (page MA-4), Audio/CTL Head height and azimuth.

#### 7-E: SET SCREW TIGHTENING

- a) Check for maximum FM output waveform, maximum audio out, and absence of tape wrinkling or other transport irregularities, then secure the guide rollers. Perform in STOP mode.
- b) Since the guide rollers are easily moved, use care when securing.
- c) After tightening the set screws, again perform interchangeability final check.

#### 7-F: INTERCHANGEABILITY FINAL CHECK

- a) Confirm section 7-I, (page MA-6), Preliminary checks.

#### 7-G: SERVO CIRCUIT ADJUSTMENT

- a) Head switching position (see page EA-3).
- b) Normal tracking preset (see page EA-4).

#### 7-H: CONTROL HEAD PHASE ADJUSTMENT

- a) Connect oscilloscope to TP-E. Trigger the oscilloscope externally with the signal from TP-C.
- b) Play staircase portion of the alignment tape and observe the oscilloscope display.
- c) Set the Tracking control to centre click position.

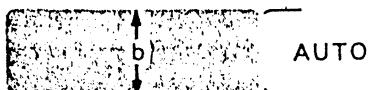
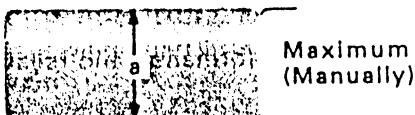


Fig.24 FM output level

- d) Confirm that the level difference between this setting and the maximum level obtained manually as shown in Fig.24 is:  
 $-20 \log b/a \geq 1.5\text{dB}$  or  $b/a \geq 0.8$
- e) If necessary, adjust as follows.
- f) Set the Tracking control to centre click position and play the alignment tape (stairstep).
- g) Loosen tracking adjustment nut ④ (Fig.20) and slide the Audio/CLT Head assembly fully to the direction of the take-up guide pole.

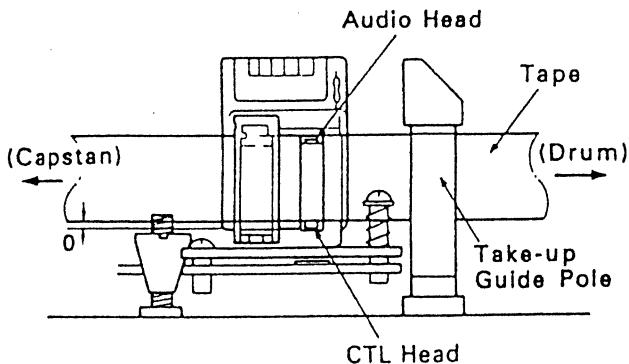


Fig.25 CTL Head phase adjustment

- h) Tighten adjustment nut and slide the Audio/CTL Head assembly slowly in the direction of the arrow as shown in Fig.25.
- i) Set the Audio/CTL Head assembly to the position where first maximum FM level is obtained. Put screw locking glue on nut ④ (Fig.20).

#### 7-I: FINAL CHECKS

- a) Confirm Section 7-I (page MA-6), Preliminary Checks.